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THE RISE IN DEATHS FROM ALCOHOLISM AMONG AMERICAN WAGE-EARNERS SINCE PROHIBITION

The rising tendency of the deathrate from alcoholism among the millions of Industrial policyholders of this Company since the Eighteenth Amendment and the Volstead Enforcement Act became operative has encouraged us to make a more intensive study of this interesting subject. It was desired, above all, to determine whether this increase was general throughout the country, or was confined, as some have suggested, to only a few states. The results show clearly that the increase since 1920 has been very general. The table on page 3 shows the results in thirteen of the larger states. The data for the smaller states, while insufficient for inclusion in this table, also point strongly to a rising deathrate from alcoholism since 1920.

Our second objective was to obtain data for comparison of the alcoholism deathrates during the period of national prohibition and the pre-prohibition period. We have felt that, in order to make these comparisons fairly, we should, as a first step, revise our previous figures and add to the total of the deaths definitely certified to us as caused by "alcoholism" those which have been reported as due to acute poisoning by wood or denatured alcohol. For, this latter group is definitely a by-product of conditions that have prevailed since the prohibitory law became effective. The addition of these deaths makes a considerable change in the number charged to "alcoholism" since 1920.

Among Metropolitan Industrial policyholders in the United States the combined deathrate for "alcoholism" and acute alcoholic poisonings in 1926, was 4.1 per 100,000, which is identical with that for alcoholism in 1911, the initial year of the period studied. The 1926 deathrate was the highest since 1917 and shows an increase of twenty-four per cent. over 1925. It was three and one-sixth times that for 1920, when the minimum deathrate for alcoholism was recorded. It

falls just short of being three times as high as the figure prevailing in 1919, the year of "war-time prohibition," and is more than double the rate of 1918, a war year, when certain restrictions were placed on the manufacture and sale of liquor. During 1918 there was, in America, a period of relative abstemiousness when millions of people were denying themselves both food and drink. There resulted a sharp decline in the deathrate from alcoholism, similar to that which occurred in England and Ireland during the war years.

The deathrate for American Metropolitan Industrial policyholders for 1926 (4.1 per 100,000), is still not as high as that prevailing in 1917, and in the five pre-war years, 1912 to 1916, inclusive, although it closely approaches that for 1915 (4.3). The maximum alcoholism deathrate was 5.4 per 100,000, as recorded in each of three years, 1912, 1913 and 1916. But since 1920, when the rate was only 1.3 per 100,000 the figures have mounted to their present proportions suggesting that, with the maintenance of present tendencies, the alcoholism deathrate of 1928 might very well reach a higher point than for any year in this series. There is, of course, no assurance that the present tendency will continue.

The situation we have noted in the country at large is found likewise over a very large number of states and in a widely scattered territory. This is clearly shown in the table on page 3 which shows the facts for most of the larger states. The situation in Maryland and in New York calls for especial attention. In the former state, in 1926, the rate, 10.1, was higher than was ever recorded. In New York State, the figure for 1926, 6.3 per hundred thousand, was exceeded in only three years, 1913, 1914 and 1916 during this sixteen-year period.

A third objective was to determine in what states deaths definitely certified as due to acute poisoning by wood or denatured alcohol were chiefly localized. These have occurred, for the most part in New York, New Jersey, Pennsylvania, Illinois, Massachusetts, Maryland, Ohio and Tennessee. They have also occurred in considerable numbers, considering the totals of persons exposed to risk, in Kentucky, Virginia, Rhode Island, and in one Canadian province—Ontario. Under present conditions of death certification, the number of deaths actually caused by acute alcoholic poisoning is undoubtedly understated. If we had more autopsies and intensive investigations of obscure fatalities, the number of such cases would undoubtedly be much increased. Nevertheless, it is of some interest to observe that the mortality from this type of alcoholism, in 1926, was less than a

third that in 1920. In other words, contemporaneous with a marked increase in deaths from "alcoholism," there has been a marked decline in deaths certified as due to acute alcoholic poisoning.

We have also wished to determine the effect of the prohibitory law on the average age at death of those dying of alcoholism, both among Metropolitan Industrial policyholders and in the general population. For male Metropolitan Industrial policyholders dying of alcoholism in the three years, 1911 to 1913, it was 43.2 years; for the three years, 1924 to 1926, it was 44.2 years. The average age at death of males who died of alcoholism in the general population was

Deathrates from Alcoholism and from Wood and Denatured Alcohol Poisoning* in Specified States and in Canada. Metropolitan Life Insurance Company, Industrial Department, Premium-Paying Business (Ages one and over), 1911-1926

YEAR	DEATHRATES PER 100,000													
	U. S. Total	Calif.	Conn.	D. C.	Ill.	Md.	Mass.	Mich.	Mo.	N. J.	N. Y.	Ohio	Pa.	R. I.	Can.
1926	4.1	1.8	3.9	4.1	3.4	10.1	5.2	4.5	3.7	3.0	6.3	3.1	3.7	7.2	.9
1925	3.3	.7	2.5	.7	2.2	4.3	3.6	3.6	2.1	3.9	5.2	2.4	4.5	1.6	.6
1924	3.2	1.2	4.3	5.8	2.3	5.5	3.5	3.1	3.2	2.5	4.3	1.5	4.4	3.6	.7
1923	3.4	1.6	4.9	5.2	3.8	6.8	4.2	5.0	3.2	2.8	4.5	1.7	3.0	7.9	.6
1922	2.5	1.5	1.9	.8	2.9	3.0	4.7	2.0	2.5	3.3	2.6	1.8	1.9	6.1	.4
1921	1.5	1.0	.8	..	1.4	2.4	2.0	2.7	1.5	1.1	1.5	.7	1.7	1.9	.7
1920	1.3	.6	.9	1.5	.9	1.5	2.3	.9	.7	1.2	1.2	1.5	1.3	2.4	.8
1919	1.4	.9	1.2	3.9	1.1	1.2	2.1	..	.5	1.4	2.2	1.8	1.3	2.1	.4
1918	1.9	.8	1.9	.8	1.0	3.4	2.2	2.6	.4	1.6	2.5	3.3	2.1	2.2	1.1
1917	5.2	.8	7.2	3.4	5.8	6.8	5.6	7.6	2.4	4.9	6.3	5.4	6.6	9.3	1.1
1916	5.4	1.8	10.8	4.8	4.7	6.6	6.1	7.1	6.0	6.9	8.3	4.4	4.1	4.3	.4
1915	4.3	4.0	6.4	6.6	3.0	3.3	5.8	2.0	4.8	3.1	5.8	3.4	3.9	6.4	1.0
1914	4.8	4.4	5.9	5.1	3.2	4.8	6.5	2.7	3.6	4.4	6.7	4.3	4.1	4.6	2.9
1913	5.4	2.4	8.1	5.2	2.9	5.9	6.0	2.3	11.5	7.9	6.8	4.0	4.0	3.5	1.4
1912	5.4	6.1	7.5	3.6	3.7	6.1	5.9	3.1	4.5	6.1	6.3	6.7	4.6	7.4	3.7
1911	4.1	1.5	3.0	7.4	2.7	4.1	7.0	1.3	3.7	4.1	5.8	5.3	3.4	3.8	.3

*Wood and denatured alcohol poisoning included from 1920 to 1926.

46.4 years in 1913 as against 46.9 in 1924. For females insured in the Metropolitan, there was a slight decline in the average age from 41.4 years in 1911-1913, to 41.1 years in 1924-1926; and in the general population, a more marked decline from 43.0 years in 1913 to 42.1 in 1924. If, as many claim, there has been increased drinking among young people in recent years, this has not as yet resulted in lowering the average age at which male alcoholics die. Among females this has actually happened.

A final and important objective was to obtain data among our

Canadian Industrial policyholders for comparison of their alcoholism deathrate with that for those living in the United States. During the sixteen-year period 1911 to 1926, there were 100 deaths from alcoholism and acute alcoholic poisoning among Metropolitan Industrial policyholders in Canada. When distributed over a sixteen-year period this number is obviously too small to constitute a strictly reliable basis for year-to-year comparison. Their very paucity, nevertheless, shows clearly that in every year, before and after national prohibition became operative in the United States, the alcoholism deathrate in Canada has been very much lower than in this country. For the sixteen-year period, the alcoholism deathrate for Canada was 0.9 per 100,000, as compared with 3.4 for the insured in the United States. Few as they are, the deaths in Canada also indicate that the alcoholism deathrate was considerably higher ten and fifteen years ago than in the more recent years. Of the 100 deaths, 42 occurred in the Province of Ontario and 40 in Quebec Province. The latter has the more policyholders and the lower alcoholism deathrate.

The facts we have disclosed above for the industrial population, as represented by the millions of Metropolitan Industrial policyholders, are, furthermore, in close agreement with those shown for the general population, up to the latest year (1925) for which data are available. The reports for the general population of the individual states are confirming, almost without exception, the findings for the wage-earning population. The conditions as to deaths from alcoholism are not restricted to any single economic class or to any limited area of the country. It is noteworthy also that the alcoholism deathrate runs much higher in the general population than among the wage-earners.

The rising alcoholism deathrate in this country since 1920 cannot, in our judgment, be explained by increased consumption of "hard" liquor as compared with wartime and pre-wartime years. The reason must lie, we think, in the greater toxicity of the alcoholic liquors which are now used so generally throughout the country. The only encouraging feature in this picture is that officials of various states, responsible for the public health, are now stirred by the situation and are preparing measures for its more adequate control.

TYPHOID FEVER IN RELATION TO FILTRATION AND CHLORINATION OF MUNICIPAL WATER SUPPLIES IN AMERICAN CITIES, 1900 TO 1924*

It is well known that during the past twenty years, typhoid fever, as a cause of death has sharply declined, until to-day it has become a very minor element in the general mortality record of American cities. Although this achievement can be attributed, in part, to the adoption of such means as pasteurization of the milk supply, the installation of proper sewage disposal, and the regulation of food handlers with a view to controlling the hazard of infection from typhoid carriers, the chief factor in the suppression of the disease in cities has undoubtedly been the purification of water supplies.

In a forthcoming monograph bearing upon the control of typhoid fever, the Metropolitan Life Insurance Company will review the history of the incidence of the disease, and will describe the successful measures that have been adopted to suppress it in American states and cities since 1860. Detailed accounts of typhoid mortality in each of a number of the large municipalities of the country will be presented in which many interesting facts regarding the disease will appear, particularly the part played by pure water in the reduction of the typhoid deathrate. Obviously, in this article, these individual histories for cities above 250,000 of population cannot be given. The complete monograph will present discussion of the facts on typhoid control in each of these larger cities. For cities under 250,000 of population there can be shown the influence that improved water supplies have had upon the typhoid fever deathrate. These smaller cities have been grouped in three size classes—25,000 to 49,999; 50,000 to 99,999, and 100,000 to 249,999.

The information regarding the water supply in these smaller cities was secured through the courteous assistance of Mr. B. H. LITTLE, Secretary of the American Water Works Association, from the super-

*Cities composing group with populations 100,000 to 249,999 are Oakland, Calif.; Hartford, Conn.; New Haven, Conn.; Wilmington, Del.; Cambridge, Mass.; Lowell, Mass.; Springfield, Mass.; Grand Rapids, Mich.; St. Paul, Minn.; Omaha, Neb.; Trenton, N. J.; Yonkers, N. Y.; Columbus, Ohio; Toledo, Ohio; Erie, Pa.; Reading, Pa.; Scranton, Pa.; Providence, R. I. and Norfolk, Va.

Cities with populations 50,000 to 99,999 are San Diego, Calif.; Evansville, Ind.; Terre Haute, Ind.; Flint, Mich.; St. Joseph, Mo.; Elizabeth, N. J.; Passaic, N. J.; Binghamton, N. Y.; Niagara Falls, N. Y.; Lancaster, Pa.; New Britain, Conn.; Springfield, Mass.; Portland, Me.; Lansing, Mich.; Duluth, Minn.; Lincoln, Neb.; Allentown, Pa.; Altoona, Pa.; Pawtucket, R. I. and Tacoma, Wash.

Cities with populations 25,000 to 49,999 are Brookline, Mass.; Superior, Wis.; Decatur, Ill. Quincy, Ill.; Muncie, Ind.; Bay City, Mich.; Montclair, N. J.; New Brunswick, N. J.; Auburn N. Y.; Kingston, N. Y.; Newburgh, N. Y.; Poughkeepsie, N. Y.; Wilmington, N. C.; Lima, Ohio; McKeesport, Pa.; Newport, R. I.; Lynchburg, Va.; Petersburg, Va.; San Jose, Calif.; Meriden, Conn.; New London, Conn.; Norwich, Conn.; Stamford, Conn.; Richmond, Ind.; Battle Creek, Mich.; Jackson, Mich.; Muskegon, Mich.; New Rochelle, N. Y.; Rome, N. Y.; Hazleton, Pa.; Woonsocket, R. I.

intendents of the water works of the respective cities. Those cities which were reported as using some method of water purification were then selected for study, and separated into three groups, according to size of population, in the following manner. The first group, composed of nineteen cities, ranged in size of population according to the United States Census of 1920, from 100,000 to 249,999. This included 46 per cent. of the population of cities of that size in the United States in 1920. The second group of twenty cities had populations between 50,000 and 99,999, and these cities had 27.8 per cent. of the population of all United States cities of this size in 1920. The third group comprising thirty-one cities, recorded at the last Federal Census from 25,000 to 49,999 inhabitants, and this group comprised 22.1 per cent. of cities in this size-class in 1920. It should be borne in mind that these groups do not contain all the cities of the country of similar size but those only which replied to our questionnaire, reported using filtered or chlorinated water in 1924, and which had mortality records for the whole period 1900 to 1924. Since so many of the smaller cities were not in the United States Registration Area in 1900, and since chlorination and filtration was not as widely practiced in 1924 among smaller cities as in the larger ones, this selection naturally reduced the volume of material for study in the lower population brackets. After the cities had been classified as to size, the typhoid fever deathrates for each group were computed for each year from 1900 to 1924. There was also computed the percentage of the total population of each group protected by water purification methods. The result was most interesting, as may be gathered from the accompanying graphs on page 8.

A glance at the graphs clearly shows the potent influence that purification of the water supply has had in reducing the typhoid deathrate. During the first decade of the twentieth century, the mortality from typhoid fever was high in all three groups of cities, ranging from 25 to 45 per 100,000 population. Very little attempt at water purification was made during these early years. Up to 1908 less than a third of the total population of each group was supplied with filtered water and practically no water was chlorinated. But about 1907 public interest in this phase of modern sanitation became awakened and from then on such measures were rapidly adopted by increasing numbers of cities, until, in 1924, approximately 90 per cent. of the combined population of these communities were using water sterilized with liquid chlorine, and above 50 per cent. had water mechanically or sand filtered.

The efficacy of these measures was immediately evident. A decided drop in the annual deathrate promptly took place and the rate proceeded to decline regularly thereafter from year to year almost in exact accordance with the increased percentage of the total population using purified water. Much the same result was achieved in the larger cities (above 250,000 of population) the individual records for which will be discussed in the forthcoming monograph.

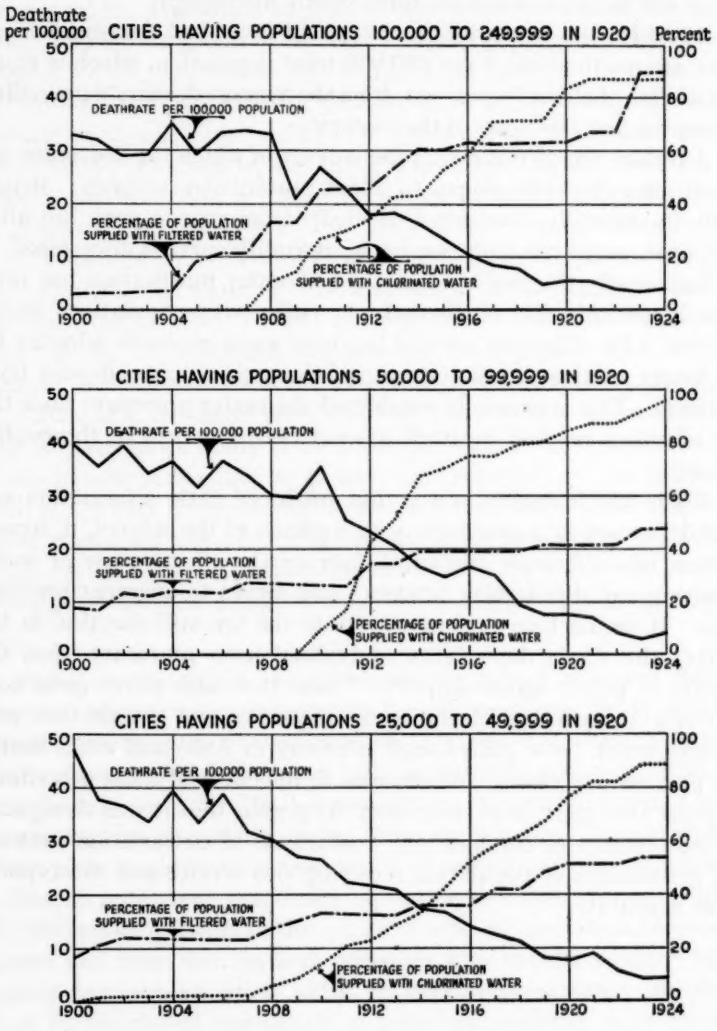
By 1924, the mortality from typhoid fever had decreased in all three groups to about 4 per 100,000 total population, which is equal to a decline of about 90 per cent. from the average deathrate prevailing during the first few years of the century.

A feature worth noticing is the *manner* in which the deathrate declined after the cities began to adopt purification methods. Before 1910, the mortality fluctuated decidedly from year to year, but after that time, very little variation in the mortality curve is discernible.

Apparently the preferred method of water purification has been with liquid chlorine, particularly in cities with populations under 100,000. The filtration method has been more generally adopted by the larger municipalities. Of course, many cities have adopted both methods. This is generally considered the better procedure since the use of either method by itself has not been found to be thoroughly reliable.

While the foregoing matter has produced little information not already known in a general way to students of the subject, it, nevertheless, offers definite numerical data on the effectiveness of water cleansing and disinfecting processes and serves to augment previous data. It should help to demonstrate to the few still skeptical in the matter the direct dependence of typhoid fever mortality upon the quality of public water supplies. These facts also prove quite conclusively the efficacy of the water cleansing and disinfection procedures which have gained such headway in American cities during the past twenty years. Inference as to the effect of these procedures in water treatment is so clear from the graphs that it was thought to be unnecessary to compute any coefficients of co-variation between the percentages of population receiving this service and the typhoid fever deathrate.

Typhoid Fever Control through Filtration and Chlorination of Water Supplies in American Cities 1900 to 1924. By Size of City.


Deathrate per 100,000
CITIES HAVING POPULATIONS 100,000 TO 249,999 IN 1920
Percent
DEATHRATE PER 100,000 POPULATION
PERCENTAGE OF POPULATION SUPPLIED WITH FILTERED WATER
PERCENTAGE OF POPULATION SUPPLIED WITH CHLORINATED WATER
CITIES HAVING POPULATIONS 50,000 TO 99,999 IN 1920
DEATHRATE PER 100,000 POPULATION
PERCENTAGE OF POPULATION SUPPLIED WITH FILTERED WATER
PERCENTAGE OF POPULATION SUPPLIED WITH CHLORINATED WATER
CITIES HAVING POPULATIONS 25,000 TO 49,999 IN 1920
DEATHRATE PER 100,000 POPULATION
PERCENTAGE OF POPULATION SUPPLIED WITH FILTERED WATER
PERCENTAGE OF POPULATION SUPPLIED WITH CHLORINATED WATER
0 10 20 30 40 50
0 20 40 60 80 100
1900 1904 1908 1912 1916 1920 1924

STATISTICAL BUREAU • METROPOLITAN LIFE INSURANCE COMPANY • O.R.S.

HEALTH RECORD FOR FEBRUARY, 1927

The excellent health conditions which prevailed among Metropolitan Industrial policyholders during the first month of 1927 continued throughout the second. The deathrate in February (9.6 per 1,000) represents a decline of four per cent., as compared with the corresponding month of 1926. This followed a five per cent. drop in January. The usual seasonal increase in the February mortality over the preceding month was observed.

Comparison of the mortality from the important causes of death, as listed on page 11, show pronounced declines from last year for measles, whooping cough, influenza, heart disease and pneumonia, and some improvement for cerebral hemorrhage and diarrheal complaints. The rates for typhoid fever, scarlet fever, diphtheria, diabetes, respiratory conditions other than pneumonia, puerperal diseases, suicides, and accidents were more or less higher than for February, 1926.

While in no instance has there been an alarming rise so far this year in the mortality from any disease, the higher deathrates recorded for diphtheria in both January and February are somewhat disconcerting items. Beginning with 1922, this disease has been registering a new low point every year. The culmination of this continuous decline, which brought about a reduction from a deathrate of 23.8 per 100,000 in 1921, to 9.5 in 1926 (a drop of 60 per cent.) was perhaps the greatest single sanitary accomplishment of last year. This decline, it was fully expected, would go on through 1927 and succeeding years, as a result of the increasingly intensified campaign for immunizing children against diphtheria which has been a demonstrated success in eliminating the disease from a number of communities. But we now have a rise in the deathrate which, although small, is nevertheless a challenge to public health workers throughout the country. Just what has been responsible for the increased mortality so far this year cannot be determined at this time. The disease, between 1900 and 1921, was shown in an article in the BULLETIN of September, 1926, to have a certain periodicity, peaks occurring with much regularity at intervals of about seven years, with half-peaks of three or four years. This can hardly be the explanation of the increase shown so far this year. A more probable explanation is that the type of the disease now prevalent is of above-average virulence. At any rate, the situation calls for increased watchfulness and intensified effort to stamp out diphtheria. Reports of deaths among Metropolitan Industrial policyholders, up to March 13th, show some concentration in the

East South Central States, and in the two most populous states of the East North Central region, Illinois and Ohio. No increase is shown in any New England state. The states showing higher diphtheria mortality, up to March 13th, are Alabama, Arkansas, California, District of Columbia, Illinois, Kentucky, Maryland, New York, North Carolina, Tennessee, and, in Canada, the Province of Ontario.

Nineteen twenty-seven has started out very badly with respect to deaths from cancer, both January and February having registered considerable increases as compared with last year.

There was, in February, a pronounced increase in suicides following a smaller increase in January. Both months have also shown smaller rises in the accident deathrate.

The general deathrate for the large cities in the United States in February was 13.7 per 1,000. This was much lower than the rate for February, 1926 (15.6). There was increased prevalence, as compared with January, of influenza, measles, scarlet fever, smallpox and whooping cough, with fewer cases of diphtheria, malaria, poliomyelitis, and typhoid fever. More cases were reported, as compared with February a year ago, of diphtheria, malaria, measles, scarlet fever, smallpox and typhoid fever, but there was less influenza, poliomyelitis, and whooping cough.

An encouraging development in the diphtheria situation is a decrease in case reports from most of the states, particularly in Georgia and New Jersey. Measles was unusually prevalent in Alabama, Kansas and Minnesota. An outbreak occurred in Marysville, Ohio. Prevalence of scarlet fever is increasing particularly in Indiana, New Jersey and Pennsylvania. It became necessary to close two colleges on account of this disease, Augustana College at Moline, Illinois, and Wabash College at Crawfordsville, Indiana.

Influenza was slightly more prevalent in February, especially in Georgia, South Carolina and Wisconsin. The disease was reported to be quite widespread in Danville, Virginia, and to have reached epidemic proportions in Ellensburg, Washington, and in several Oregon counties.

In Georgia, smallpox cases increased from 184 during the first three weeks of January to 348 during the corresponding weeks of February. The *Weekly Bulletin* of the New Mexico State Health Department reports that health officers along the northern border of that state were cautioned against the importation of the disease from Pueblo, Colorado.

The following table shows the mortality among the Industrial policyholders for February, 1927; January, 1927; February, 1926 and the year 1926.

METROPOLITAN LIFE INSURANCE COMPANY

Deathrates* per 100,000 for Principal Causes, Premium-paying Business in Industrial Department (Annual Basis)

MONTHS OF FEBRUARY, 1927; JANUARY, 1927, AND OF FEBRUARY, 1926

CAUSES OF DEATH	RATE PER 100,000 LIVES EXPOSED*			
	Feb. 1927	Jan. 1927	Feb. 1926	Year 1926†
TOTAL—ALL CAUSES	956.6	928.2	997.0	942.7
Typhoid fever	3.1	2.4	2.6	4.2
Measles	5.5	3.6	13.2	10.2
Scarlet fever	5.2	3.0	4.6	3.4
Whooping cough	5.3	6.9	7.5	9.6
Diphtheria	11.3	13.6	9.8	9.7
Influenza	30.0	26.1	37.6	31.0
Tuberculosis (All forms)	99.7	80.2	99.8	98.7
Tuberculosis of resp'y system	88.5	69.2	88.6	86.5
Cancer	75.5	72.7	70.1	73.5
Diabetes mellitus	18.9	17.1	16.0	16.7
Cerebral hemorrhage	57.1	57.8	60.4	55.5
Organic diseases of heart	136.7	146.5	146.3	133.9
Pneumonia (All forms)	118.0	118.5	139.6	97.9
Other respiratory diseases	18.6	14.9	16.1	13.1
Diarrhea and enteritis	14.3	14.1	15.2	29.8
Bright's disease (Chronic nephritis)	80.2	72.3	80.0	73.3
Puerperal state	14.9	13.8	14.7	15.3
Suicides	7.8	7.6	5.7	7.6
Homicides	7.2	5.8	5.0	7.0
Other external causes (excluding suicides and homicides)	54.0	61.8	53.2	62.2
Traumatism by automobiles	11.5	12.8	11.4	16.7
All other causes	193.5	189.5	199.7	190.4

*All figures include infants insured under one year of age.

†Based on provisional estimate of lives exposed to risk in 1926.

Correspondence on the subjects discussed in these BULLETINS may be addressed to: The Editor,

STATISTICAL BULLETIN,
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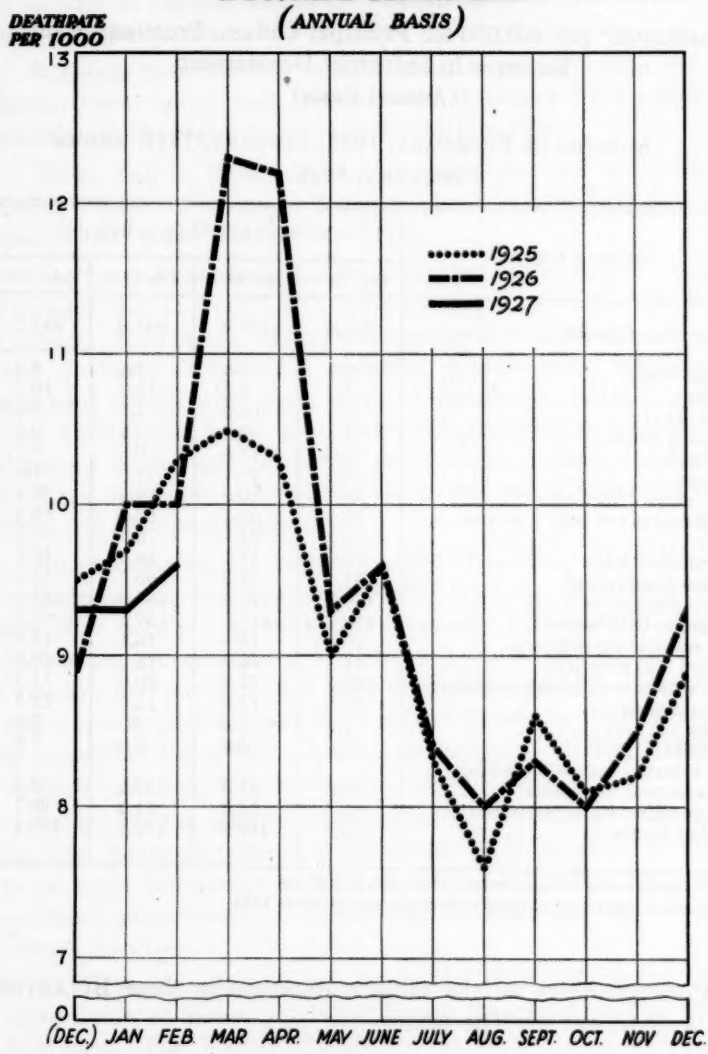
Deathrates from All Causes

METROPOLITAN LIFE INSURANCE CO.
INDUSTRIAL DEPARTMENT
(ANNUAL BASIS)



(DEC.)	JAN	FEB.	MAR	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV	DEC.
1925	9.7	10.3	10.5	10.3	9.0	9.6	8.3	7.6	8.6	8.1	8.2	8.9
1926	10.0	10.0	12.3	12.2	9.3	9.6	8.4	8.0	8.3	8.0	8.5	9.3
1927	9.3	9.6										

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